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Inferior vena cava extension of pelvic osteogenic sarcoma

Alexandre Arkader[a] and Carol D. Morris[b]

[a]Children's Orthopaedic Center, Children's Hospital Los Angeles, Keck School of Medicine, University of Southern California, Los Angeles, CA, USA and [b]Orthopedic Surgery Service, Department of Surgery; Memorial Sloan-Kettering Cancer Center affiliated with Weill Medical College of Cornell University, New York, USA

Corresponding address: Alexandre Arkader, MD, Children's Orthopaedic Center, Children's Hospital Los Angeles, 4650 W Sunset Blvd., Mailstop #69, Los Angeles, CA 90027, USA.
Email: aarkader@chla.usc.edu

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Abstract

The prevalence of intravascular extension of bone sarcomas of the pelvis is unknown. We report a case of intravascular extension of an osteogenic sarcoma of the pelvis into the vena cava, correlating the pre-operative imaging findings with the intra-operative findings and specimen analysis. A brief review of the literature is provided.

Keywords: *Pelvic sarcoma; intravascular metastasis; osteogenic sarcoma; Osteosarcoma.*

Introduction

Osteogenic sarcoma is the most common primary malignant tumor[1,2]. Although it is more frequently seen in the long bones, pelvic sarcomas occur and pose special challenges regarding the complex local anatomy and usual large size at presentation[3,4]. Distant metastases are usually the culprit for a fatal prognosis. Although the lungs are the most common site for metastatic disease associated with sarcomas, they can involve any organ. Intravascular invasion is only rarely discussed or reported and may also play an important role in the prognosis and management of this condition.

Case report

A 21-year-old female was diagnosed with high-grade osteogenic sarcoma of the right ilium extending to the sacrum ala, associated with a large soft-tissue mass, displacing the intra-abdominal organs and extrinsically compressing the vascular structures, resulting in pulmonary emboli. The patient underwent placement of a filter in the inferior vena cava for presumed pulmonary embolus from a venous thrombosis and was started in neo-adjuvant chemotherapy according to our institution's protocol[5].

Despite two cycles of chemotherapy the tumor continued to grow, extending distally into the thigh. Computerized tomography (CT) demonstrated enlargement of the soft-tissue mass and with an adjacent thrombus of the right common iliac vein and inferior vena cava (Fig. 1).

Due to uncontrollable pain and poor response to the treatment and in light of no evident distant metastatic disease, definitive treatment with extended external hemipelvectomy was performed. Gross examination of the specimen revealed direct tumor invasion through the right common iliac vein (Fig. 2). Microscopic examination confirmed the diagnosis of intravascular osteogenic sarcoma.

Discussion

Osteogenic sarcoma is the most common primary bone tumor[1,2]. It is usually seen around the knee and shoulder. Pelvic osteogenic sarcomas represent approximately 5% of all tumors[3]. Osteogenic sarcomas are very aggressive tumors that tend to metastasize in particular to the lungs and approximately 15% of the cases present with distant disease[5,6].

The prevalence of intravascular extension of bone sarcomas is unknown. Although there are few reports of

Figure 1 **CT reconstruction of the abdomen and pelvis demonstrate a large soft-tissue mass arising from the right ilium (*) and with an adjacent thrombus in the inferior vena cava (arrow). Note the IVC filter at the level of the renal vein (superior to the thrombus).**

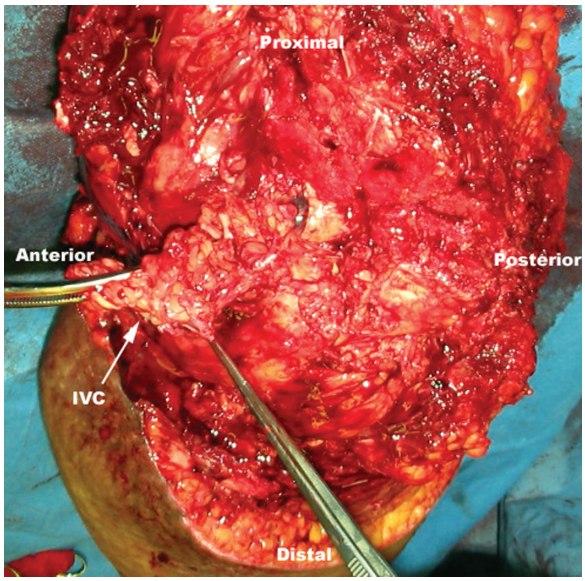

Figure 2 **Following hemipelvectomy, the gross specimen demonstrated tumor invasion into the common iliac vein and inferior vena cava (arrow).**

retrieved vena cava filters showing neoplastic cell implantation associated with lower extremities and pelvic sarcomas[7,8], these are thought to be a consequence of hematogenous showering of metastatic cells during the surgery rather than true tumor growth within the vessels.

There are a few reports of cardiac metastatic involvement with osteogenic sarcoma that suggest vena cava system involvement[9]. However, these cases better represent long distance disease rather than true juxta-tumor invasion[9–11]. Pelvic osteosarcoma has also been seen to invade the periprostetic venous complex[12].

This case is unique but calls attention to a problem that is probably under-appreciated. Large pelvic sarcomas probably invade the main vessels more frequently than thought and this can negatively impact the surgical success rates. Modern imaging techniques may improve our diagnostic capability and help planning tumor resection.

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